AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
	1

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO.(If applicable)
U0003	15-Jul-2007		

6. ISSUED BY	CODE	7. ADMINISTERED BY (If other than item 6)	CODE
AFGHANISTAN ENGINEER DISTRICT US ARMY CORPS OF ENGINEERS KABUL APO AE 09356	W917PM	See Item 6	

8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)		
	X	9A. AMENDMENT OF SOLICITATION NO. W917PM-07-R-0084
	X	9B. DATED (SEE ITEM 11) 14-Jun-2007
		10A. MOD. OF CONTRACT/ORDER NO.
		10B. DATED (SEE ITEM 13)
CODE / FACILITY CODE		

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[X] The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer [X] is extended, [ ] is not extended.

Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

[ ] A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

[ ] B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).

[ ] C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

[ ] D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

ANA Heating & Cooling Upgrades Lashkar Gah

The above mentioned solicitation is amended to include the corrected building data and to include the model heat an cooling study that was done at Mazer-e-Sharif, Afghanistan.

As a result of this amendment the solicitation is extended proposals are due not later than 19 July 2007 at 5:00p.m.

All other terms and conditions remain unchanged.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) TEL: EMAIL:	
15B. CONTRACTOR/OFFEROR _____ (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY _____ (Signature of Contracting Officer)	16C. DATE SIGNED

ANA-Building Data

SITE: LASHKAR Gah
Date:May 2007

Note	Buildings Type	Buildings Numbers	Nr. Bld	WL m2	Tot. m2	FD m2	Tot. m2
	Barracks						
	Barracks Type A	201, 202, 203, 226, 224, 222, 221, 243, 244, 245, 416, 417, 412, 426, 427, 422, 431, 435, 436, 442, 443, 446	22	413	9086	436	9592
	Barracks Type B	223, 225, 241, 242	4	413	1652	436	1744
	Barracks Type C	414, 424, 433, 444	4	413	1652	436	1744
	Barracks Type D	204, 227, 228, 413, 411, 415, 418, 421, 423, 425, 428, 432, 434,437, 438, 441, 445, 447, 448	19	413	7847	436	8284
	Senior NCO Bldg	205	1	336	336	436	436
	BOQ						
	BOQ Building 2	302, 303, 304, 305, 307	5	170	850	566	2830
	BOQ Building 3	301	1	333	333	1287	1287
	BOQ Building 4	306	1	263	263	755	755
		Sub-totals	**31**	**2754**	**22019**	**4788**	**26672**
	Toilet/Shower						
	Toilet/Shower	206, 419, 429, 439, 229, 246, 449	7	413	2891	470	3290
		Sub-totals	**7**	**413**	**2891**	**470**	**3290**
	HQ Building	Nr.Bldg	W. m2	Tot m2	FD m2	Tot. m2	tkW
	Battalion HQ	410, 420, 430, 220, 240, 440	6	336	2016	341	2046
	Brigade HQ	101	1	497	497	552	552
	Garrison HQ	100	1	614	614	990	990
		Sub-totals	**8**	**1447**	**3127**	**1883**	**3588**
	Medical Clinic						
@	Medical Clinic	310	**1**	**456**	**456**	**890**	**890**
	Dining /Training						
1	DFAC	260	1	700	700	2110	2110
	Training Building	266	1	550	550	1202	1202
		Sub-totals	**2**	**1250**	**1250**	**3312**	**3312**
	Maintenance/Warehouse/Storage						
@	Arms Storage Bldg	200A	1	259	259	350	350
@	Battlion Storage Building	410B, 420B, 430B, 220B, 240B, 440B	6	732	4392	800	4800
@	Central Receiving Warehouse	264	1	924	924	1519	1519
@	Class VII Warehouse Bldg	265	1	732	732	800	800
#	Class VIII Warehouse Bldg	311	1				
	Maintenance Garage	210, 230	2	1008	2016	1426	2852
	Laundry Building	263	1	400	400	419	419
	CS Maintenance Building	230, 248	2	627	1254	613	1226
		Sub-total	**13**	**4282**	**9577**	**5508**	**11547**
	Force Protection		Nr.Bldg	W. m2	Tot m2	FD m2	Tot. m2
@	Reception Center	130	1	259	259	74	74
#	Entry Guard Booth		2				
		Sub-total	**3**	**259**	**259**	**74**	**74**
	Infrastructure						
#	Guard Towers	150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 181	13				
#	Pol Storage Buildings	207A, 209A, 410A, 420A, 430A, 220A, 240A, 440A, 320A	9				
@	Comms Bldg	300	1	245	245	278	278
@	Fire Station	450	1	270	270	129	129
#	Prime Power Plant	600	1				
#	Water Booster Pump Station & Treatment	452	1				0
#	Well House	451	1				
#	Wastewater Treatment Bldg	901	1				0
		Sub-total	**5**	**515**	**515**	**407**	**407**

Most bulidings already have R-19 roof insulation, in this case only apply addition R-19 to roof insulation to meet requirements.
Contractor is responsible to verify all quantities and dimensions before bid.

Nr.BLD = Number of buildings of the same type, per compound. **WL m2** = Wall surface area (perimeter x height) for each bldg.
Tot.m2 = Total wall surface (ignore windows & doors) of same type of bldgs. **FD m2** = Floor area of each building, m2.
Tot.m2 = Total floor area of same type of bldg's (bldg m2 x Nr of bldgs), m2 **tkW** = Heat required for each building, thermal kilo-watts (tkW)
Nr = Number of Heat-Cool Units required for each building. **TNU** = Total Number of Units for each type of building.

\# **No Work required for these buildings**
@ **Provide insulation only for these buildings**
1 **DFAC, the kitchen already has HVAC, only add new HVAC to the dining area.**

Heat-Cool Unit, see Dwg. "ANA HEAT-COOL DESIGN-02"

HEAT DESIGN FOR ANA: GARDEZ, HEART, MAZER-E-SHARIF :: 22 NOV 06 :: M. HORTON

A	B	C	D	E	F	G
3	HEAT DESIGN OPTIONS RANK: 10 = EXCELLENT 1 = EXPENSIVE, POOR	PERINI "A & B ALL ELECTRIC HEAT NEW: 2-GEN-SETS	PERINI "C" WOOD-BURN STOVES 60 $/m3 150 $/1000 kg	PERINI "D" PROPANE INDIVIDUAL HEATERS 0.65 $ / lt	**** AED **** DIESEL BURN HEATERS W/ EVAP-COOLING 0.92 $ / lt	**** AED **** HEAT-PUMP AHU, HEAT & COOL. ELECTIC PWR COP = 2.8
5	RANK CONSTRUCTION COST. US$	1 9,250,000	9 1,200,000	3 4,500,000	8 1,900,000	2 7,200,000
7	RANK FUEL COST. US$ (FUEL ONLY)	1 2,560,000	9 920,000	7 1,110,000	8 1,040,000	9 920,000
9	RANK MAINTENANCE COST. US$	2 510,000	5 70,000	6 100,000	5 80,000	3 240,000
11	O&M COST. US$ SUM (B7 + B9)	3,070,000	990,000	1,210,000	1,120,000	1,160,000
13	PER YEAR COST 10 YEAR OPER. B5 / 10 + B11	4000000 $4.00 M	1110000 $1.11 M	1660000 $1.66 M	1310000 $1.31 M	1880000 $1.88 M
	EASE OF USE	10	1	9	9	10
	TOTAL RANK	14	22	25	30	24

COMPUTATION PARAMETERS COSTS ARE FOR ONE SITE (MAZER-E-SHARIF)

TOTAL HEATED FLOOR AREA = 45,000 m2 :: WINTER MAX DIFF dt = 30 'C, SUMMER dt = 15 'C
VENTILATION (NO SMOKING) 15 m3/h / PERSON :: DENSITY 3 m2 / PERSON (M/F)
THERMAL RESISTANCE: WALLS, R = 3.5 m2-'C / watt (R 20); ROOF, R = 5.5 m2-'C / watt (R30)
HEAT LOAD TAKEN AS 0.15 tkW / m2 FLOOR AREA :: WINDOWS & DOORS 20% OF WALLS
HEATING SEASON TAKEN AS 4 MONTHS, (120 days AT 12 h / day) FOR ABOVE COSTS
TOTAL HEAT:: 45,000 m2 * 0.15 tkW / m2 * 120 days * 12 h/day = 9,720 tmW-h (8.36 E9 Kcal)
CATERPILLAR 75% LOAD: 800 ekW / 218 lt/h * 0.95 (5% LOSS) = 3.49 ekW-h / lt DIESEL
TYPICAL DIESEL BURNING HEATER: 85 tkW * 0.80 eff / 7.80 lt / h = 8.72 tkW-h / lt DIESEL.
DIESEL: 44.8mj/kg*238.9Kcal/mj*0.86kg/lt / 860 Kcal/h/tkW = 10.70tkW/lt * 0.80 eff = 8.56 tkW-h/lt
AVG. WOOD:3900(Kcal/kg*400(kg/m3)*0.35(eff) / 860(Kcal/h/tkW) = 635(tkW-h/m3) [1.59 tkW-h/kg}
VOLUME WOOD (20% MOIST.) VS. DIESEL-BURNING HEATER = 8.60 / 0.635 = 13.5

NOTE: FOR GEN-SETS, 15% OF FUEL COSTS ARE ADDED TO MAINTENANCE LISTED COSTS.
FOR ELECTRIC (RESISTANCE) HEAT: MAINT. = C7(FUEL) * 0.15 + 125,000
CONSTRUCTION COST = EQUIPMENT + MATERIALS + INSTALLATION (ie air ducts)

PROSOSE OPTION "F" BASED ON CONSTUCTION & FUEL COSTS AND OPERATION EASE
AHU (AIR HANDLING UNIT) DIESEL-HEATER HAS CAPABILITY OF EVAPORATIVE COOLING IF SUMMER WET-BULB TEMP. IN THE 20 TO 25 'C RANGE; COOLING IS ABOUT 1/2 OF A/C REFRIGERATION COOLING. PROPANE BURNERS CAN BE USED IN PLACE OF DIESEL.
PACKAGE UNIT, 75 tkW (250 MBH) MOUNTS OUTSIDE, ONLY AIR-DUCTS REQUIRED INSIDE.

Conclusions & Recommendations

Conclusions

The analysis conducted on the several courses of action have yielded many insights into the cost, feasibility, and suitability of installing each of the different proposed heating systems as defined within the RFP. The following is a brief summary discussion for each course of action and below, under **Recommendations**, is a discussion of the recommended actions to be taken to mitigate heat deficiencies on the site, as well as a tabulation of the recommendations for each facility type.

A) **Course of Action A: Correcting Heat Deficiencies within Original Design Intent:**
This course of action would generally install electric heaters in locations where provisions for installation (wiring and outlet boxes) have already been installed. In addition, most of the electrical infrastructure, including electrical distribution equipment and power plant capacity is already in place on the site to support the infrastructure requirements of this course of action. This equipment is relatively maintenance free, fairly durable, and easy to operate. For these reasons, installation of electric heat in pre-wired areas should be considered a preferred course of action.

B) **Course of Action B: Correcting Heat Deficiencies with Change in Design Standards to Account for Afghan Usage:**
This course of action is similar to Course of Action A in that it would generally install electric heaters in locations where provisions for installation (wiring and outlet boxes) have already been installed. Under this course of action, the equipment to be supplied would include provisions to make it suitable for Afghan usage, including tamper proof thermostats and mechanical protection from potential abusive treatment. These equipment "upgrades" are relatively inexpensive and would provide added protection to prolong the life of the equipment and ensure consistent system operability.

However, this course of action also requires that the derating of the electrical heating loads included in the load calculations for each facility be removed to take into account that Afghans have shown the propensity to use full load on heating. Therefore the electrical heating load for each facility must be taken at 100% of the connected load under this course of action. The electrical distribution infrastructure (transformers, service drops, and distribution panels) for many facilities is not of sufficient size to serve the increased electric heating load at 100% of connected load. In addition, there are major Prime Power Plant expansion implications (new generators and building expansion) associated with this course of action that are very significant and costly.

This course of action is effective in addressing the operational challenges of installing equipment suitable to the abuse and misuse of the ANA. However, it

may not be appropriate to size and install equipment to meet the 100% demand criteria on heating loads. Rather, the protection of controls (thermostats) from unauthorized use and an increased diligence in gaining ANA cooperation to reduce system tampering would go a long way toward negating the need for 100% demand considerations on the electric heating system design. Should these steps not be seen as realistic with regard to the ANA's usage, it may beneficial to consider upgrading the services for each building to prevent nuisance tripping and/or overloading at each facility. However, diversity of demand across the site (not all facilities occupied at the same time and not all occupied buildings operating at 100% heat load) can certainly be expected such that expansion of the Prime Power Plant may not necessarily be required. Expansion of the Prime Power Plant may be contemplated but should not be implemented until operating experience determines that the actual winter heating demand does indeed reach or exceed actual generating capacity. At a minimum, the equipment upgrades associated with this course of action should be considered for implementation.

C) **Course of Action C: Correcting Heat Deficiencies with Wood Burning Systems**

This course of action would install wood stoves that have a greater heating efficiency than those currently installed. In addition, the cast iron construction of the proposed wood stoves would be more durable than those currently installed. Heating with wood stoves provides the ANA with a system that they are familiar operating and maintaining. Given the relatively low cost of replacing the existing wood stoves, the above benefits to the ANA in heating efficiency and longevity, while not introducing a complicated heating system, are significant and should be considered. No new locations were identified where wood stoves should be installed.

D) **Course of Action D: Correcting Heat Deficiencies with Propane Burning Systems**

Under this course of action, propane burning systems are proposed to be installed in all areas where wood burning stoves have been installed under the original design and construction at the base. In some cases, locations have been identified where additional propane burning systems could supplement or replace electric heat within a building, or be installed where no heat is currently provided. Propane burning systems are relatively complex systems versus the heating methods that the ANA is normally used to operating and maintaining. In addition, propane systems will require significant operations and maintenance commitments. For these reasons, the benefits of replacing wood stoves with propane burning systems are not significant enough to warrant consideration.

There are two locations where installation of propane burning systems may be warranted in lieu of electric heating. The electric heating load associated with each Maintenance Garage and the CS Maintenance Building is substantial. Installation of propane burning systems in the open bay areas of these facilities

will greatly reduce the electric heating load on the site and reduce the impact on the Prime Power Plant.

Recommendations

Based on the evaluations of each course of action outlined in the conclusions above, the following is a summary of recommended actions to be taken to mitigate the heat deficiencies in on the site. Facility specific recommendations follow below.

- Install electric heaters in all facilities where provisions for electric heat were included in the original design and construction, with the exception of the open maintenance bay areas within the Maintenance Garages and Maintenance Building.

- Revise the heating system in the open maintenance bays of the Maintenance Garages and Maintenance Building to be propane burning systems in accordance with Course of Action D.

- Provide all electric heaters in accordance with Course of Action B which provides for the more durable heating units and tamper proof thermostats.

- Provide a new electrical heating system in all Toilet and Shower Buildings.

- Provide a new electrical heating system in the Fire Station.

- Replace all wood burning stoves with new, more efficient and more durable stoves and with electric heat re-claimers in the flues in accordance with Course of Action C.

- Do not add heat to the storage areas of the Central Receiving Warehouse and do not add heat to the Arms Storage Buildings or Battalion Storage Buildings.

- Replace the wood stove with an electric heating system in the Guard House.

- Replace the wood stove with electric heat in the classroom of the Communications Center.

- Do not revise the electrical distribution system and infrastructure to support a 100% use factor on heating load.

- Continue with the planned upgrade of the Prime Power Plant to 7MW since it appears that this will be adequate to support the needs of the base.

There is no single course of action that satisfies all facility needs. In some cases, multiple heating systems are recommended (as currently configured on the base or as proposed below). The following is a list of facilities and the actions recommended to mitigate the heat deficiencies within each facility:

BUILDING TYPE	RECOMMENDED ACTION
Barracks Type A	Install electric heaters in accordance with COA B and replace wood stoves.
Barracks Type B	Install electric heaters in accordance with COA B and replace wood stoves.
Barracks Type C	Replace wood stoves.
Barracks Type D	Install electric heaters in accordance with COA B and replace wood stoves.
Senior NCO	Install electric heaters in accordance with COA B.
Bachelor Officers Quarters	Install electric heaters in accordance with COA B.
Toilet/Shower	Install electric heaters in accordance with COA B.
Battalion Headquarters	Install electric heaters in accordance with COA B and replace wood stoves.
Brigade Headquarters	Install electric heaters in accordance with COA B and replace wood stoves.
Garrison Headquarters	Install electric heaters in accordance with COA B and replace wood stoves.
Dining Facility	Install electric heaters in accordance with COA B and replace wood stoves.
Training	Install electric heaters in accordance with COA B and replace wood stoves.
Arms Storage	Install electric heaters in accordance with COA B in those areas addressed in the baseline design. Do not add heat in the storage bays.
Battalion Storage	Install electric heaters in accordance with COA B in those areas addressed in the baseline design. Do not add heat in the storage bays.
Central Receiving Warehouse	Install electric heaters in accordance with COA B in those areas addressed in the baseline design. Do not add heat in the storage areas.
Class VIII Warehouse	Install electric heaters in accordance with COA B.
Maintenance Garage	Install electric heaters in accordance with COA B in enclosed spaces. Provide new propane burning systems in open maintenance bays.
CS Maintenance Building	Install electric heaters in accordance with COA B in enclosed spaces. Provide new propane burning systems in open maintenance bays.
Reception Building	Install electric heaters in accordance with COA B and replace wood stoves.
Guard House	Remove wood stove and install electric heaters in accordance with COA B.
Guard Tower	Install electric heaters in accordance with COA B.
Communications Center	Remove wood and install electric heaters in accordance with COA B.
Fire Station	Install electric heaters in accordance with COA B.

Other Considerations

Course of Action E in the 1 February 2006 RFP, but not authorized for this study, included several alternate heating methods to be studied. While many of the noted alternative heating methods noted may be too expensive to construct and/or maintain, as well as depend on technology that is not easily operated by the ANA, there are some that may warrant further evaluation by the customer. For example, there are sources of fuel such as waste oil (particularly at the Prime Power Plant) and trash that are normal by products of site operations and use. These fuel sources could perhaps be used on isolated areas of the site to fuel multi-fuel burning systems to provide hot air or hot water to heat specific buildings or a complete barracks complex.

QUESTIONS & ANSWERS (Q&A)

ANA Heating & Cooling Upgrades Lashkar Gah

(Questions & Answers provided for informational purposes only)

If any Government responses indicate a change to the technical proposal, it is not official until and amendment is issued)

15 July 2007

Q = Question
A = Answer

Q. Referring to Appendix B (Data Sheet); the total wall & floor area don't equal to the multiplication of the number of buildings by bldg wall area or bldg floor area, for example, total wall are of barrack A is stated 7,021 m2, while by calculating 22 (Nr. Of bldg) X 413 (wall surface area) is equal to 9,086 m2. Therefore, for bidding purposes please advise which quantity to be considered in pricing.

A. Correct Data sheet sent out by amendment 0003

Q. Referring to Appendix B (Data Sheet); it includes floor area only for some buildings like the laundry and the medical clinic, please advice whether the wall insulation is required for these buildings or not?

A. The attached updated building list shows wall area and floor space for the Laundry building. The list also indicates the Laundry building will be retrofitted with heating/cooling and insulation.

Note: All quantities shall be verified by the contractor.